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# PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION under 37 CFR 1.53(b)(2).

Docket Number **STRAK-506**

Type a plus sign (+) inside this box [+]

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**TITLE OF THE INVENTION** (280 CHARACTERS MAX)

**WIRELESS CONTROL FOR CREATION OF AND COMMAND RESPONSE TO STANDARD FREIGHT SHIPMENT MESSAGES**

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**ENCLOSED APPLICATION PARTS** (check all that apply)

☒ Specification Number of Pages: 6 ☒ Small Entity Statement
APPLICANT IS A SMALL ENTITY
☒ Drawing(s) Number of Sheets: 3 ☐ Other (specify) _____

**Method of payment** (check one)

☐ A check or money order is enclosed to cover the Provisional filing fees.

☒ The Commissioner is hereby authorized to charge filing fees and credit Deposit Account No. **194124.**

Provisional Filing Fee Amount: $ 80.00 **APPLICANT IS A SMALL ENTITY**

The invention was made by an agency of the United states Government or under a contract with an agency of the United States Government.

☒ No.

☐ Yes, the name of the U.S. Government agency and the Government contract number _____

Respectfully submitted,

Signature L. Stanger Date: 6/25/03

Leo Stanger

☐ Additional inventors are being named on separately numbered sheets attached hereto.

# WIRELESS CONTROL FOR CREATION OF AND COMMAND RESPONSE TO STANDARD FREIGHT SHIPMENT MESSAGES

## Field of the Invention

This invention relates to remote control of freight assets during transit or other states.

## Background of the Invention

The condition, such as temperature, of freight assets have in the past been detected by sensor and alarms sent to websites to alert users of adverse conditions so that attendants could make appropriate corrections. This messaging system has been cumbersome and presented difficulties.

## Summary of the Invention

An embodiment of the invention involves transmitting sensed conditions of freight assets via one code to a database which sends the data to a user utilizing user compatible codings.

Another embodiment involves the database comparing the sensed conditions with requirements from a user and sending the discrepancy to the user.

Another embodiment involves the database commanding devices of the freight asset to correct discrepancies.

These and other aspects of the invention are pointed out in the claims. Objects and advantages of the invention will become evident from the following detailed description when read in light of the accompanying drawings.

## Brief Description of the Drawings

The drawings illustrate various embodiments of the invention.

## Detailed Description of the Drawings

This invention utilizes wireless intelligence on a freight asset to evaluate status conditions that automatically trigger transmissions and generate industry standard freight industry messages, which may be used for tracking and monitoring of freight assets and shipments. A corollary of the invention utilizes industry standard freight shipment messages that are evaluated against wireless messages transmitted from a freight asset with wireless intelligence to send command actions to the asset, which change or alter a monitored freight condition. Another corollary involves a method that permits a user to create an industry standard freight message by sending a wireless notification to an asset, which would respond to the notification with a wireless transmission, resulting in an industry standard freight message.

A basic embodiment of the invention appears in Fig. 1.

The specialized aspect of this invention involves a specialized condition of a freight asset FA1, monitored in real-time, which creates an alarm or event condition within an

intelligent electronic device ED1 on the asset, by virtue of the intelligence of that device. The alarm or event condition is sent via an encoded wireless communications link CL1 to a wireless database DB1. The wireless message from the electronic device ED1 is encoded particularly for the bandwidth restrictions of the wireless communication link CL1. In the wireless database DB1 a translator TR1 formats the message into a standard Electronic Data Exchange (EDI) or Extensible Mark-up Language (XML) freight message FM1 containing relevant information for the asset. The translator TR1 transmits the message FM1 to users at a database DB2 with information systems that accommodate the standard message types EDI or XML. This process permits the intelligent electronic device ED1 of the monitoring system on the freight asset FA1 to transmit standard, "open systems" messages, which are delivered into the existing information systems, namely database DB1, of users of freight equipment. An advantage of the invention is that the device on the asset automatically evaluates a condition appropriate to provide information that is normally derived from other sources (i.e. wayside monitoring systems that tell when an asset passes by and human creation of events that occur at under specific conditions). One example of this embodiment of the invention would involve the local knowledge of location of the asset FA1, by use of a geographic positioning system (gps) sensor or equivalent, when the asset FA1 moved into a user designated location, where the asset FA1 would generate a wireless message, formatted into an industry standard message by the translator TR1 for delivery into the database DB2 of an information system. The newly formatted message from the translator TR1 would contain information delivered from the asset FA1, including for example, gps location, time of arrival or departure, and the condition of the freight (door position, temperature, set point

temperature, presence of auxiliary equipment, etc.). Another example of this process would involve a laborer changing the temperature set point on the asset FA1, such as a refrigerated trailer or railcar, which causes the device ED1 to generate an encoded wireless message that the translator TR1 ultimately delivers as a standard industry message FM1 to the user at database DB2. With these given messages, the user may compare the wireless generated information from equipment located on the asset to shipping records and provide immediate context to the shipment without the need for local reading devices or operator inputs. Fig. 1A illustrates steps in the operation.

Another embodiment appears in Figs. 2 and 3. This involves the generation of a wireless command by the database DB1 to the asset FA1 to change a condition based on a discrepancy between an industry standard freight message FM2 and information transmitted from the freight asset FA1 using encoded wireless communications via the device ED1. Upon the receipt of the industry standard freight message FM2 generated by the user database DB2 specific to an individual freight asset FA1, the database DB1 compares recent encoded wireless messages from the asset FA1 via the electronic device ED1 to the newly received freight message FM2. Should an exception occur resulting from a discrepancy between the originating message FM2 and the encoded wireless message, which involve a specification for the freight shipment, such as a destination, temperature setting, routing violation, and recent wireless messages, then the database DB1 sends a wireless command to the intelligent electronic device ED1 on the asset FA1, which changes the condition of the asset FA1. In one example, a user sends an industry standard freight message FM2, via the database DB2 to the database DB1, specifying a

specific temperature setting for a commodity contained within a specific freight asset FA1, and the temperature setting is compared to and found different from, a recently received actual temperature setting received via encoded wireless communications from the asset FA1 via the device ED1. Then an automatic command is sent to the intelligent electronic device ED1 instructing it to change the temperature set point to the newly prescribed temperature setting of the message FM2. Upon enacting the change in temperature, the electronic device ED1 sends an encoded wireless message confirming that the action took place. The translator TR1 in turn forwards this message in an industry standard freight message EDI or XML. Another example would involve the automatic sending of a command to a unit to lock the freight doors once the asset has left a prescribed location delivered to the database via an industry standard message.

Yet another embodiment appears in Figs. 4 and 5. This involves a method to create a standard freight industry message by accessing a database and sending a command via wireless communications to an intelligent device attached to a freight asset. Upon receipt of the command from the user via database DB1, the intelligent device ED1 creates a transmission that results in an industry standard freight message FM1 in a method similar to the embodiments above.

In these embodiments, the standard freight messages FM1 involve, for example, bills of lading (404), waybills (417), Terminal Operations and Intermodal Ramp Activity (322) messages and car location messages, which contain relevant information about freight shipments. These messages, and related messages, would be created from encoded

wireless messages via satellite, cellular or radio frequency communications in the first embodiment. In an embodiment, these messages, and related messages, would be used to specify the actual conditions of the freight, and the wireless communications links would be used to assure via control mechanisms, that the freight shipment meets the specification.

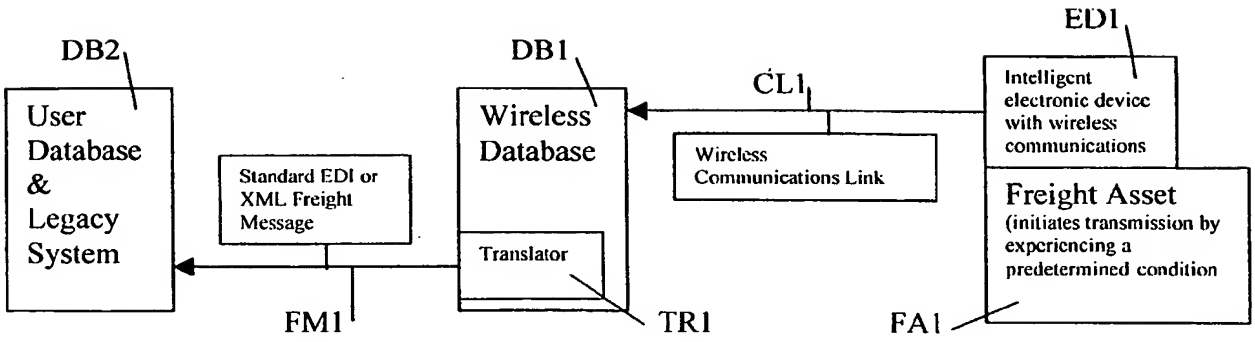
DB2
User Database & Legacy System
Standard EDI or XML Freight Message
FM1
DB1
Wireless Database
Translator
TR1
CL1
Wireless Communications Link
ED1
Intelligent electronic device with wireless communications
Freight Asset
(initiates transmission by experiencing a predetermined condition
FA1

FIG. 1

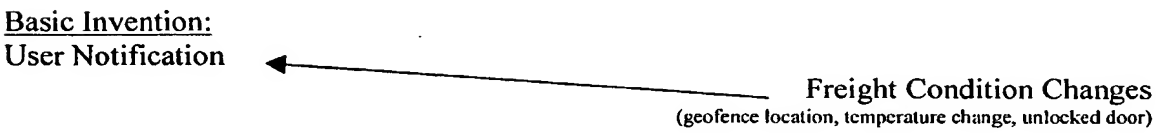
Basic Invention:
User Notification
Freight Condition Changes
(geofence location, temperature change, unlocked door)

FIG. 1A

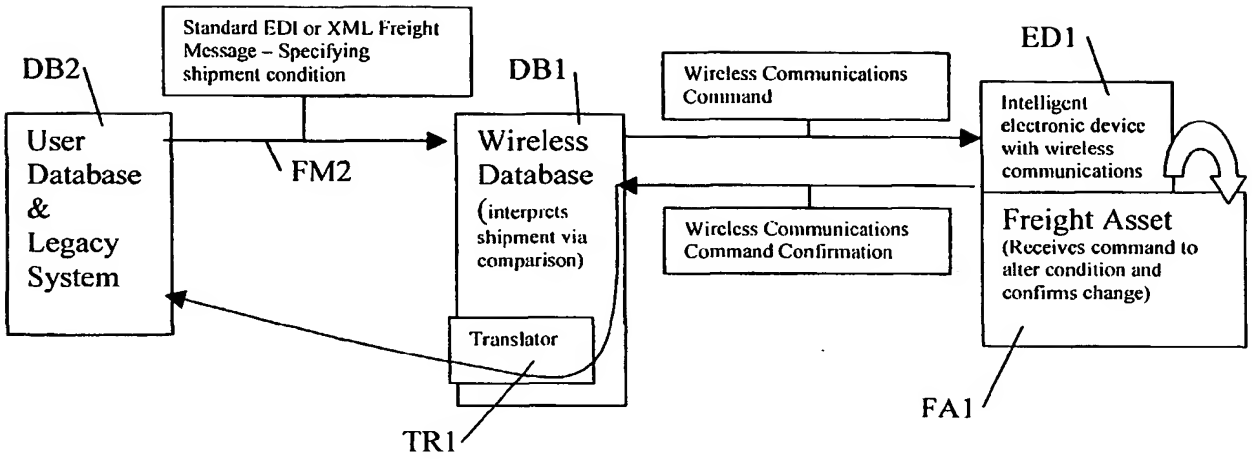
DB2
Standard EDI or XML Freight Message – Specifying shipment condition
DB1
Wireless Communications Command
ED1
User Database & Legacy System
FM2
Wireless Database (interprets shipment via comparison)
Intelligent electronic device with wireless communications
Wireless Communications Command Confirmation
Freight Asset (Receives command to alter condition and confirms change)
Translator
TR1
FA1

FIG. 2

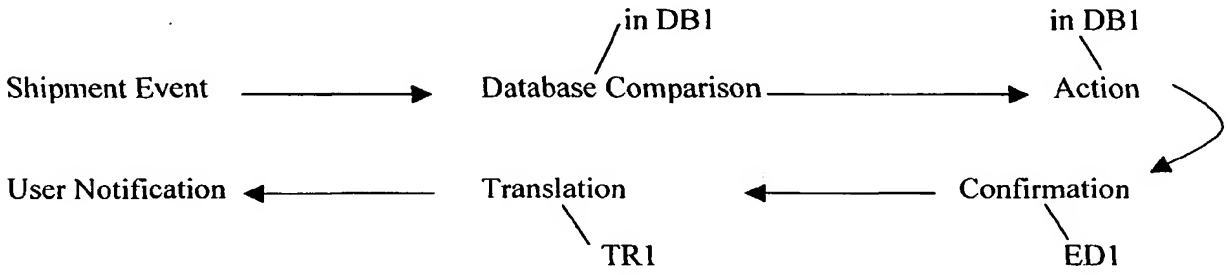
in DB1
in DB1
Shipment Event
Database Comparison
Action
User Notification
Translation
Confirmation
TR1
ED1

FIG. 3

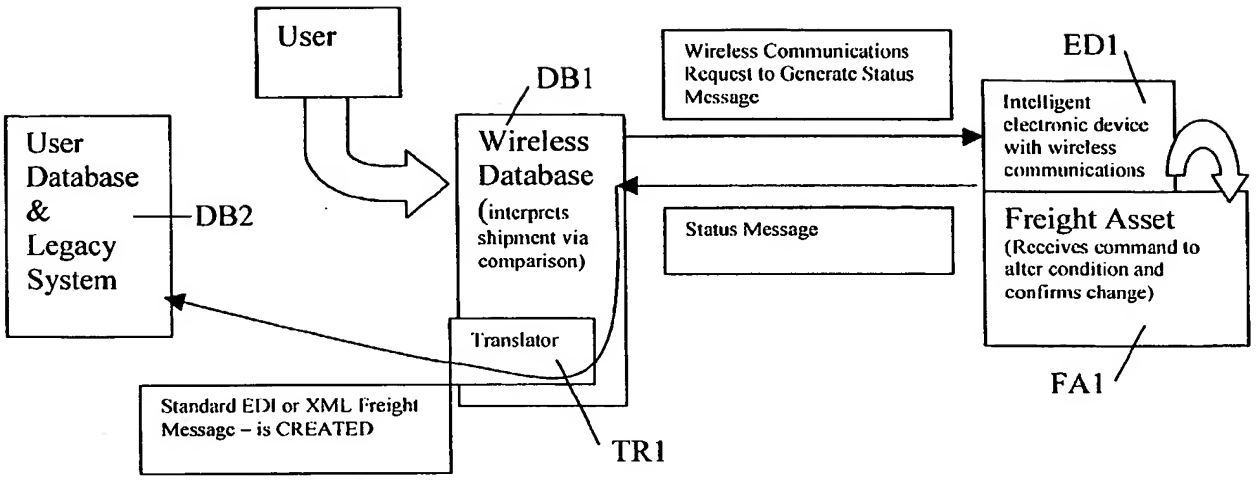
User
DB1
Wireless Communications Request to Generate Status Message
ED1
Intelligent electronic device with wireless communications
User Database & Legacy System
DB2
Wireless Database
(interprets shipment via comparison)
Status Message
Freight Asset
(Receives command to alter condition and confirms change)
Translator
Standard EDI or XML Freight Message – is CREATED
TR1
FA1

FIG. 4

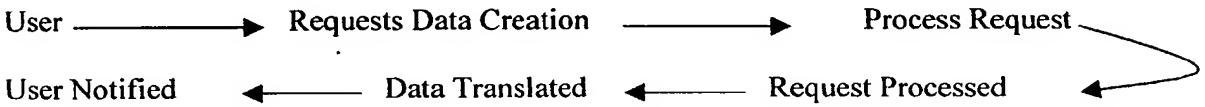
User
Requests Data Creation
Process Request
User Notified
Data Translated
Request Processed

FIG. 5

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